Andean Past

Volume 7 | Article 9

2005

Exchange of Quispisisa Obsidian in Nasca: New Evidence from Marcaya

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Introduction

Obsidian from the newly relocated Quispisisa source (Burger and Glascock 2000) has been recovered in numerous archaeological contexts throughout the central Andes (Burger and Asaro 1979; Burger *et al.* 2000; Burger and Glascock 2000). Quispisisa obsidian has been found in prehispanic sites dating as early as 9000 years ago, but the wide-scale distribution of the obsidian began during the Early Horizon with the pan-Andean spread of Chavín influence (Burger 1992:211). The distribution of Quispisisa obsidian became extensive during the Wari conquest for it has been recorded in Middle Horizon sites up to 800 km away from its source location (Burger and Glascock 2000:267). Although several Early Intermediate Period sites are known to have small quantities of Quispisisa obsidian, its use during this time, especially in the Nasca region, is poorly understood.

In this paper we provide new evidence for the use of Quispisisa obsidian in the Nasca region during the Early Intermediate Period. We present data from the Early Nasca village of Marcaya where obsidian artifacts in the form of reduction flakes and finished tools were recovered in recent excavations. A sample of the obsidian from Marcaya was submitted to the Research Reactor, University of Missouri (abbreviated MURR) for instrumental neutron activation analysis (INAA). We found that the entire sample was composed of Quispisisa obsidian. These new data combined with evidence from other excavations in the Nasca region suggest that Quispisisa obsidian was used extensively in the Nasca region during the EIP.

This discussion begins with a presentation of the archaeological context for the present study. We then turn to the context in which the obsidian was found at Marcaya, describe the methods used to chemically analyze the obsidian, show the results of that analysis, and finally, discuss the implications that the new data have for our understanding of Nasca society specifically and for the distribution of Quispisisa obsidian more generally.

Nasca Archaeology and Obsidian

The Nasca region of the south coast of Peru encompasses the valleys made up by the Ica and Grande drainages and their tributaries (Figure 1). The entire region is dry and hot. The rivers that run through the valleys are only intermittently filled with water and are classified as "influent streams" (ONERN 1971; Schreiber and Lancho 1995). The primary area of interest here is what we refer to as the Southern Nasca Region, which includes the four southernmost tributaries of the Grande drainage.

The south coast was the locus of several early indigenous cultural developments including Paracas of the Early Horizon and Nasca of the Early Intermediate Period (EIP). We use a chronology that divides Nasca culture during the EIP into phases 2-7 (Table 1). Following others (Carmichael 1988, 1998; Schreiber 1999; Schreiber and Lancho Rojas 1995), we divide Nasca into the "Early Nasca" (phases 2-4), "Middle Nasca" (phase 5) and "Late Nasca" (phases 6-7) cultures.

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Horizons and Intermediate Periods	*Nasca culture names*	*Nasca phases*	*Approximate dates*
Late Horizon			A.D. 1476 – 1532
Late Intermediate Period			A.D. 1000 – 1476
Middle Horizon			A.D. 750 – 1000
Early Intermediate Period	Late Nasca	6, 7	A.D. 550 – 750
	Middle Nasca	5	A.D. 450 – 550
	Early Nasca	2, 3, 4	A.D. 1-450
Early Horizon	Proto Nasca	1	100 B.C. – A.D. 1
			800 – 100 B.C.
Initial Period			1800 – 800 B.C.
Archaic			9000 –1800 B.C.
Paleoindian			12000?-9000 B.C.

Table 1. Peruvian and Nasca chronology. For simplification, detail is only given for the Nasca culture. After Carmichael 1998; Schreiber 1998: Table A-1; Schreiber and Lancho 1995: Table 2.

Recent research confirms the suggestion (*c.f.* Willey 1971:145) that Nasca developed from the Paracas culture as populations from the northern south coast migrated to the Nasca region by the late Early Horizon and occupied a few small villages (Schreiber 1998:262; Silverman 1994). By Early Nasca, settlement shifted into small villages in the upper valleys and Cahuachi, the ceremonial center of the region, reached its apogee (Silverman 1993a), and Nasca culture had emerged (Schreiber 1998: Table A-1; Silverman 1993a). Middle Nasca is a time of transition when the ceramic art reached its height of perfection (Carmichael 1998) and monumental construction ceased at Cahuachi (Orefici 1992; Silverman 1993a). It also appears that as populations continued to use Cahuachi, other inhabitants from the region moved into the middle valleys for the first time in prehistory (Schreiber and Lancho 1995). During Late Nasca times, the region saw possible increase in conflict and a reorganization as populations consolidated into a few large villages in each valley (Schreiber 1998:263, 1999). At the beginning of the Middle Horizon (approximately A.D. 750 in the Southern Nasca Region), the region came under control of the Wari Empire (Schreiber 1999; though see Silverman 1993a, 1993b).

Obsidian has been recovered from excavations in Nasca (see below), Nasca pottery has depictions of what appear to be obsidian points in scenes of hunting and warfare (Figure 2; also see Kroeber and Collier 1998: plates 12 and 20), and obsidian played a ritual role in Nasca society (Silverman 1993a:285). Nevertheless, only two sites in the Southern Nasca Region have source data for their obsidian assemblages: San Nicolás and Poroma. Located along the northeastern shore of the San Nicolás Bay about 70 kilometers southwest of the modern town of Nasca, San Nicolás is a Preceramic site first recorded by William Duncan Strong in 1952 (Strong 1957). The site consists of at least five shell middens measuring 15-25 meters in length and 3 to 4 meters in height (*ibid.*:10). The lithic assemblage at the site included an obsidian knife and ". . . many flakes, cores, and nodules of both black and red-flecked obsidian which represented work shop debris." San Nicolás was revisited in 1958 by a team from the Instituto de Etnología y Arqueología of the University of San Marcos. This team recovered several more obsidian projectile points but collected no samples for chemical analysis (Vescelius 1963).

Poroma is a site dating to the Early Intermediate Period (Burger and Asaro 1979:307) located in the Las Trancas Valley of the Nasca region. The site may be the Poroma cemetery referred to in Strong's article (Strong 1957: figure 1), or it could be either of the Poroma sites recorded by Kroeber as "Poroma A" and "Poroma B." Both of the latter sites, however, appear to date to the Late Intermediate Period (Kroeber and Collier 1998:83).[1] Thus, Poroma is most likely the site recorded by Strong. The Poroma obsidian assemblage is not described in detail.

In the 1970s, Burger and Asaro (1979) analyzed a sample of obsidian from prehistoric sites in Peru using X-ray fluorescence (XRF) and neutron activation analysis (NAA). The sample included obsidian from both San Nicolás and Poroma. All forty-six pieces of the obsidian sample from San Nicolás undergoing XRF and the three fragments subjected to NAA came from the Quispisisa source, as did the three pieces of obsidian from Poroma analyzed by XRF (*ibid.*:Table 3).

[1] "Poroma" usually refers to a sector in the middle portion of the Las Trancas Valley (Schreiber 1998:269).

Although Burger and Asaro included only two sites from the Southern Nasca Region in their sourcing study, they did include many other sites from the south coast of Peru. Samples from the Initial Period sites of Erizo, in the Ica Valley, and Hacha, in the Acarí Valley, contained mostly Quispisisa obsidian (*ibid*: Table 3 for a summary of the sites). Samples from the Early Horizon sites of Media Luna, Tajahuana, and Ocucaje A of the Ica Valley and the Early Horizon site of Chincha D of the Chincha Valley consisted entirely of Quispisisa obsidian. Finally, the Early Intermediate Period Ica Valley sites of Ocucaje B and San José de Cordero contained only Quispisisa obsidian (see Figure 1).

The predominance of the Quispisisa obsidian in the south coast of Peru, and indeed in much of the Central Andes, led Burger and Asaro (*ibid*:318) to suggest that this mine was the major source for obsidian in an interaction sphere of Central Peru which included the area encompassed by the Nasca region as it is defined here. Although relatively few samples from the south coast have been chemically analyzed since the original publication, the published data suggest that Quispisisa was the major source of obsidian for prehistoric populations on the south coast of Peru. Nevertheless, other obsidian sources aside from Quispisisa have recently been reported in the Central Andes including Jampatilla (Figure 1; Burger *et al.* 1998a), Chivay (Burger *et al.* 1998b),[2] and Alca (Burger *et al.* 1998c; Jennings and Glascock 2002).

In the past two decades, excavations in the Southern Nasca Region at Cahuachi (Silverman 1993a:285) and La Esmeralda (Isla 1990:75), a Preceramic (Archaic) occupation at Cahuachi, have recovered a small quantity of obsidian artifacts. Because of the predominance of Quispisisa obsidian at south coast sites, both authors suggest that the obsidian is most likely from the Quispisisa source. However, both recognize that this attribution is not supported by chemical analysis. The chemical analysis of obsidian from Marcaya (see below) makes Silverman's and Isla's suggestions more probable.

[2] This source is also referred to by some as Cotallaulli (Brooks *et al.* 1997).

THE MARCAYA SITE

Marcaya is located along the northern slopes of the Tierras Blancas River Valley approximately 16 kilometers east of the modern town of Nasca. It lies just upstream from the coastal desert, within the foothills of the Andes at an elevation of 1000 meters above sea level. Marcaya was first recorded by Katharina Schreiber in 1989 during her survey of the southern Nasca tributaries in the Proyecto Nasca Sur (Schreiber 1989). Schreiber dated Marcaya to Early Nasca based on the diagnostic ceramics collected from its surface. Marcaya is one of the first of the many recorded Nasca domestic sites to have been excavated. The data recovered in excavations provide valuable insight into Nasca village life and, by extension, Early Nasca economic and socio-political organization (Vaughn 2000).

Excavations at Marcaya confirm that it is Early Nasca in date, while surface mapping reveals it to be a village site composed of approximately seventy structures clustered into groups of smaller, round buildings with attached ovoid structures (Figure 3). Based on the archaeological remains and their spatial organization, Vaughn (2000) has argued that the round structures are houses and the larger ovoid structures are patios, or activity areas . The houses and patios of Marcaya are organized into patio groups composed of combinations of one or more houses attached to one or more patios. Because the patio groups are spatially segregated, contain the material correlates of domestic activities, and are repeated within the community, they appear to be the residential loci of archaeologically recognizable households (*e.g.*, Stanish 1989, 1992; Vaughn 2000).

The twenty-three patio groups at Marcaya would represent twenty-three households if they were all occupied at the same time. Indeed, the site did have a relatively short occupation. Diagnostic ceramics from Marcaya are Nasca 3d and Nasca 4 (*e.g.*, Proulx 1968), and the pottery corpus is composed of both classic Nasca polychrome fineware and plainware utilitarian vessels (Vaughn 2000; Vaughn and Neff 2000).

Vaughn conducted extensive excavations at Marcaya to obtain data on the variability of artifact assemblages between households. In all, he excavated eight different patio groups for a total of 206 square meters. Excavations revealed that households at Marcaya processed and stored their own food, spun camelid wool, and participated in what has been referred to as the regional "Nasca ceramic complex" (Carmichael 1995:171), and more recently as the "Nasca craft economy" (Vaughn *et al.* 2002). Households also carried out lithic production. Lithic materials recovered in excavations at Marcaya include chipped stone tools, stone debitage, and ground stone (Vaughn 2000). All excavated patio groups contained evidence of chipped stone tool production. The lithic assemblage ranged from shatter and flakes associated with lithic reduction to blades, retouched flakes, small cores, drills, and projectile points.

Structure 11A contained a particularly high concentration of chipped stone debitage and tools. This structure is the large western patio of Patio Group V at Marcaya (see Figure 3). Excavations were conducted here because there was a high density of lithics on the surface of the structure. The cultural stratum yielded a large quantity of lithics made from a wide variety of raw material types, including obsidian, chalcedony, basalt, chert, and quartzite (Figure 4). The overall quantity of lithic materials recovered within Structure 11 greatly exceeded that of other excavated structures at Marcaya (Table 2). Due to the concentration of lithic debitage found in excavations in Structure 11, Vaughn hypothesized that it was a small-scale lithic workshop.

Raw materials in the entire lithic assemblage at Marcaya also included quartzite, chert, basalt, chalcedony, and obsidian (Figure 5). Flake tools were created by either re-utilizing a flake left over from lithic reduction or by reducing a core to an intended shape and subsequently modifying it into a tool. Although Valdez (1994:677) has suggested that projectile points are rare at Nasca sites, flake tools at Marcaya included 16 obsidian projectile points. Other tools included bifacially flaked knives (n=4), one made of obsidian and three of basalt, bifacially flaked tools (n=10), nine made of obsidian and one of chalcedony, drills (n=6) all made of chalcedony, and utilized flakes (n=13) made of obsidian, chalcedony, and basalt (Figure 6). Most tools in the lithic assemblage were probably reduced by direct percussion flaking, and retouched with pressure flaking.

Patio group	*Meters^3 excavated*	*Obsidian index*	*Lithics index*
I	10.5	0.92	5.14
V	16.7	3.02	69.76
VIII	1.5	1.33	16
X	8	0.25	4.75
XI	26.7	1.1	6.93
XII	22.2	0.43	15.63
XIV	0.5	2	0
XXII	0.9	0	0

Table 2. The quantity of lithics recovered in excavations in Patio Group V greatly exceeded that of other patio groups. The obsidian and lithics indices were calculated by dividing the grams of artifacts recovered per cubic meter excavated.

Although non-obsidian lithics make up more than 70% of the lithic assemblage at the site, their use in the manufacture of formal tools was limited. In fact, with the exception of the chalcedony drills probably used for making holes in ceramic sherds for spindle whorl manufacture, the chalcedony biface, and the three bifacially flaked knives made of basalt, most tools found at Marcaya were made of obsidian.

The assemblage at Marcaya included very small cores, as well as primary (any flake with cortex) and secondary waste flakes (flakes without cortex including retouched flakes) and finished tools (Figure 7). Neither excavations nor surface collections produced large nodules of obsidian. While primary reduction in particular and debitage in general indicate that obsidian was reduced at Marcaya, the lack of large nodules suggests that obsidian may have been brought to Marcaya as preforms subsequent reduction into finished tools.

Macroscopic physical characteristics alone suggest at least two types, and possibly three (Types 1-3), of obsidian in the Marcaya assemblage. Type

1 obsidian is black with red-flecks, Type 2 obsidian is clear with parallel black streaks, and Type 3 was an intermediate type that had characteristics of both Types 1 and 2.

The two nearest known obsidian sources are in the department of Ayacucho at Quispisisa situated in the Caracha drainage and at Jampatilla located in the Carhuarazo Valley (Burger *et al.* 1998a; Burger and Glascock 2000), both over 100 kilometers from the Nasca region. The Type 1 obsidian from Marcaya bore a strong resemblance to published descriptions of Quispisisa obsidian, that is, black with red flecks. Types 2 and 3 also fit Burger and Asaro's description of the variability of Quispisisa obsidian. Because of the distance to known obsidian sources, and because Burger and Asaro (1979:282) caution against sourcing obsidian solely by macroscopic physical attributes, Vaughn decided that a chemical analysis of a sample of the assemblage from Marcaya was needed to determine the source of the obsidian.

With permission of the Instituto Nacional de Cultura (INC) of Peru, Vaughn exported thirty fragments of obsidian to the United States to submit for INAA at MURR. The sample included the three types of obsidian from excavated contexts within two different structures at Marcaya including Structure 11, the proposed workshop, and one secondary flake collected from the surface (Table 3).

The obsidian artifacts were prepared for INAA by assigning individual six-letter Ids (KJV001 through KJV030) to each artifact and using a diamond-edged trim saw to remove about 100 mg from each artifact. Samples for analysis were weighed into clean high-density polyvials used for irradiation at MURR. Weights were recorded to the nearest 0.01 mg.

Obsidian samples were irradiated sequentially for five seconds in pairs using a thermal neutron flux of 8×10^{13} neutrons cm^{-2} s^{-1}. Twenty five minutes after the end of irradiation, the individual samples were separately mounted in rotating holders a distance of 10 cm from the face of a pair of high-resolution, high-purity germanium (HPGe) detectors where they were counted for 12 minutes each. During the count, the gamma-ray spectra for each sample was collected to measure six short-lived elements: Ba, Cl, Dy, K, Mn, and Na. By comparison to certified standards of SRM-278 Obsidian Rock and SRM-1633a Fly Ash, similarly prepared and analyzed, the concentrations of the six elements were determined in each sample. Glascock *et al.* (1994) describe this method in more detail.

The concentrations of elements in the unknown artifacts were compared to a database of obsidian types in the region of interest. In particular, the concentrations for elements Ba, Mn, and Na are most useful for determining the sources of artifacts in southern Peru (Figure 8). Our analysis clearly demonstrates that all thirty fragments of the obsidian sample came from the Quispisisa mine, despite the fact that the sample included three visually distinct types. This is congruent with Burger and Asaro's (1979:301) caution that obsidian from Quispisisa has a variety of color characteristics from black to gray to red with a range of transparencies. We discuss the implications of these results below.

DISCUSSION

Following the work of Burger and Asaro, archaeologists who have conducted fieldwork recently in the Nasca region have assumed that obsidian artifacts from prehistoric contexts were of the Quispisisa type, based on its ubiquitous presence in prehispanic south coast sites. The data presented in this report demonstrate that local populations in the Nasca region, such as the community that lived at Marcaya, did indeed use Quispisisa obsidian exclusively. This new evidence accord with the extensive use of Quispisisa obsidian during the Preceramic at San Nicolás and its presence at the EIP cemetery of Poroma. Furthermore, the data presented here suggest that obsidian was not brought to Marcaya as finished tools, but rather was brought to the region as preforms and reduced locally to make projectile points and other tools.

MURR ID	Artifact#	Type	Fragment Type	Ba (ppm)	Cl (ppm)	Dy (ppm)	K (%)	Mn (ppm)	Na (%)
KJV001	11g1:130	1	primary flake	694	439	2.02	3.55	358	2.80
KJV002	11g1:133	1	primary flake w/retouch	695	320	0.73	3.65	365	2.91
KJV003	11g1:135	1	secondary flake	656	348	1.76	3.55	363	2.86
KJV004	11g1:142	1	primary flake	696	384	1.58	3.74	375	2.92
KJV005	11g1:145	1	primary flake	633	276	1.75	3.84	378	2.91
KJV006	90su:1*	1	secondary flake	660	395	2.10	3.71	365	2.90
KJV007	26h4:1	1	secondary shatter	582	328	1.69	3.69	368	2.90
KJV008	26h4:4	1	primary flake	624	582	1.65	3.56	365	2.85
KJV009	11c1:44	1	biface margin	530	377	1.93	3.81	359	2.87
KJV010	11c1:45	1	secondary flake	651	361	1.51	3.67	359	2.85
KJV011	11c1:47	1	secondary flake	615	330	1.59	3.64	357	2.81
KJV012	11g1:131	2	primary flake	621	391	1.63	3.35	374	2.89
KJV013	11g1:137	2	primary flake	569	459	1.75	3.76	367	2.84
KJV014	11g1:138	2	primary flake	701	362	1.82	3.57	366	2.87
KJV015	11g1:139	2	primary flake	648	362	1.44	3.72	354	2.82
KJV016	11g1:141	2	secondary flake	756	338	1.47	4.23	358	2.83
KJV017	11g1:143	2	secondary flake	712	434	0.90	3.40	366	2.80
KJV018	11g1:146	2	biface margin	753	398	1.79	3.59	367	2.83
KJV019	11g1:156	2	biface margin	713	368	1.71	3.71	372	2.89
KJV020	11g1:157	2	primary flake	726	389	2.27	3.73	379	2.93
KJV021	26h4:3	2	primary flake	680	420	1.58	3.42	373	2.87
KJV022	26h4:5	2	primary flake	742	335	1.80	3.57	380	2.94
KJV023	26h4:7	2	primary flake	708	426	1.93	3.72	366	2.78
KJV024	26f2:1	2	primary flake	691	371	1.69	3.42	367	2.86
KJV025	11c1:46	2	secondary flake	713	336	1.68	3.58	366	2.83
KJV026	26f2:2	3	primary flake	788	394	1.75	3.60	366	2.82
KJV027	26h4:2	3	primary flake	655	395	2.15	3.67	366	2.83
KJV028	26h4:6	3	primary flake	682	388	1.43	3.52	367	2.84
KJV029	26h4:7	3	primary flake	689	373	1.63	3.68	369	2.81
KJV030	26h4:12	3	primary flake	716	319	1.89	3.68	370	2.85

** This flake was collected from the surface.*

Table 3. The obsidian sample from Marcaya with concentrations for six elements measured with the short irradiation technique.

The only confirmed exception to the ubiquity of Quispisisa obsidian in the south coast is in the far southern region at the Initial Period site of Hacha located in the Acarí Valley. Of 64 obsidian fragments sourced, 40 (62.5%) were from Quispisisa (Burger *et al.* 1998a:Table 3), while 2 (3%) were not classified and the others came from Jampatilla and another, as of yet unidentified, obsidian source called Andahuaylas A – presumably located in Apurímac (*ibid.*:231). According to Burger *et al.* (*ibid.*:230), these data suggest a pattern of interaction linking diverse ecological zones from the Acarí to the Sondondo (Carhuarazo) rivers. Aside from Hacha, however, every other south coast site tested (n=11), including Marcaya, has yielded only Quispisisa obsidian.

The newly confirmed location of the Quispisisa obsidian source is only several days walk from Nasca, up one of the valleys that make up the Southern Nasca Region and across the puna. From Marcaya, one can go directly up the Tierras Blancas Valley until the puna is reached, an estimated two days walk away. From the puna, it would probably take an additional one to two days to reach the source.

Distances between vertical ecological zones in the Nasca region are relatively small, and it is not uncommon to hear of people today who make journeys in one or two days simply to travel to the weekly market in Nasca. For example, near Chuquimaran Vaughn (2000) spoke with two Uchuytambo residents travelling from their hamlet in the upper reaches of the Las Trancas Valley to Nasca to sell flowers at the Sunday market. Lacking pack animals, they carried their cargo in several large sacks (*costales*). The journey at that point had taken over ten hours, and they anticipated another ten to twelve hours to get to Nasca.

This modern example demonstrates that even today, people travel a great distance to exchange goods in the Nasca region. These exchanges would have been made that much easier with pack animals in a llama caravan. The journey between the puna and Marcaya would have probably taken less than two full days. In exchange for local products (*e.g.*, maize, chili peppers [*ají*], etc.), and perhaps even grazing rights (*e.g.*, Flores Ochoa 1975:13), Quispisisa obsidian could have been brought to Marcaya by puna dwellers. On the other hand, our data do not allow us to exclude the reverse pattern, with Nasca inhabitants travelling to the puna to exploit obsidian outcrops directly.

The first scenario of puna dwellers travelling to lower altitudes to exchange goods is one envisioned originally by Burger and Asaro (1979) for the distribution of Quispisisa obsidian throughout the central Andes. They suggest that puna dwellers with their camelid herds could have traveled to lower elevations during the dry season to trade highland goods for products not available in the puna such as *ají* and maize. This model, supported by both ethnographic and ethnohistoric examples, is conceivable in the context of reciprocal, household exchanges. Burger and Asaro (*ibid*.:317) propose another scenario that they refer to as a "nationalized" obsidian source exploited and distributed through a central agent, entailing a relatively high level of sociopolitical complexity. Although distinct, these scenarios are not mutually exclusive as prehispanic people easily could have been engaged in both methods of exchange and distribution concurrently.

The models proposed by Burger and Asaro were developed based on specific Andean contexts. Models of obsidian procurement, exchange, and distribution from other regions of the New World follow a similar dichotomy (though again not mutually exclusive) of reciprocal, household exchanges based on kinship ties (either real or fictive) and redistribution from incipient or established elites. Peterson *et al.*'s (1997) study of the acquisition, distribution, and exchange of Hohokam obsidian is an example of these exchange mechanisms in a prehistoric context. They propose reciprocal exchange models that they call the "opportunistic" model and the "kin based geographic" model that entail exchanges and/or acquisition of obsidian based on family or kin-based reciprocal ties (*ibid*.:237-238). Their "centralized redistribution model" is far more complex and envisages local elites controlling the movement of obsidian. In this model, elites not only used obsidian as a sumptuary good, but also controlled its redistribution.

Recent published accounts of the sociopolitical organization of Nasca conclude that the society was a multi-village polity organized at the level of a chiefdom (Vaughn 2000), a "confederacy of chiefdoms" (Silverman 1993a:321), a series of "loosely allied . . . 'chiefdoms'" (Schreiber 1998:262), or a polity that was at the "mid to low end of the chiefdom continuum" (Carmichael 1995:181). In short, the sociopolitical organization of Nasca society, though not a state as earlier presumed (Massey 1986; Rowe 1963), was certainly "complex" enough to allow for incipient or even established elites to control the movement of obsidian throughout the Nasca region. Vaughn (2000:531) has argued, however, that elites in Nasca probably did not wield coercive power, and instead took advantage of authority based on their access to supernatural knowledge related to agricultural fertility. We envision two scenarios of how obsidian reached the Nasca region given the relative proximity of the puna to Marcaya. First, the scenario of puna dwellers with llama caravans journeying from the highlands to establish or to reinforce reciprocal exchange ties with communities at lower elevations seems a likely explanation for the presence of Quispisisa obsidian in the region. A second scenario of coastal dwellers occasionally exploiting raw material sources in the highlands is also a possibility given these new data from Marcaya.

Another question that remains to be asked is why the assemblage at Marcaya contains only Quispisisa obsidian when the source of Jampatilla obsidian is also near. Burger *et al.* (1998a:229) noted that we would expect Jampatilla obsidian to be distributed in the Nasca region because a road (Schreiber 1984:274, 1992) connecting Wari with Nasca passed through the Carhuarazo Valley in the Department of Ayacucho, where the Jampatilla source is located. It is unknown exactly how much this Nasca-Ayacucho connection extended into prehispanic times prior to the Middle Horizon. However, Nasca sherds are occasionally found in the Carhuarazo Valley at EIP sites (Schreiber 1992:139), suggesting that there was at least some contact between the two regions during the EIP.

Burger *et al.* (1998a:231) account for the wider distribution of Quispisisa obsidian when compared to Jampatilla by suggesting that the latter was inferior geologically and thus had the status of a "minor" source of obsidian in Andean prehistory. Indeed, it is possible that Jampatilla obsidian had inferior knapping qualities and that the excellent knapping qualities of Quispisisa obsidian made that source more desirable. This preferential pattern of high quality obsidian exploitation is found throughout the Andean region. Preceramic hunter-gatherers living over 10,000 years ago in the Ayacucho Valley preferred the Quispisisa source despite the fact that a closer source (Puzolana) was locally available (Burger and Glascock 2000:265). Additionally, throughout prehistory in the southern Andes two high quality obsidian sources, Chivay and Alca, were preferred over lower quality obsidians (*e.g.*, the as yet unlocated Tumuku and Chumbivilcas sources) (Burger *et al.* 2000:348).

Although the exchange of Quispisisa obsidian continued into the EIP (Burger and Asaro 1979:307; Burger and Glascock 2000), the pattern of that exchange and exploitation is not as well known as in the Early Horizon and in the Middle Horizon. Marcaya is just one EIP site from the Nasca region, but the data presented here demonstrate that Quispisisa obsidian remained in active use during this period. For now, we await chemical analyses from additional sites in the south coast in order to develop more explicit models of obsidian procurement and distribution.

ACKNOWLEDGMENTS

Funding for fieldwork at Marcaya was provided by Fulbright Hays Doctoral Dissertation Research Abroad Fellowship P022A70041 and Wenner Gren Foundation for Anthropological Research Small Grant #6227. Additional funding for the instrumental neutron activation analysis was provided by the Missouri University Research Reactor where analytical charges were reduced through a National Science Foundation supported program (#SBR-9503035). We are grateful to the Instituto Nacional de Cultura for granting a permit to excavate at Marcaya (#2063-97) and for granting permission to bring the obsidian artifacts to the United States for chemical analysis. Richard Burger graciously kept us abreast of his recent fieldwork in locating the Quispisisa source. We also acknowledge Jeffrey Bertel who prepared the samples for irradiation. Christina Conlee, Jelmer Eerkens, Justin Jennings, Katharina Schreiber, Helaine Silverman, Dawn Vaughn, and several anonymous reviewers who read earlier drafts of this paper. Their comments and suggestions were invaluable in preparation of this final draft. Finally, we would like to thank Lisa DeLeonardis for her helpful comments and encouragement.

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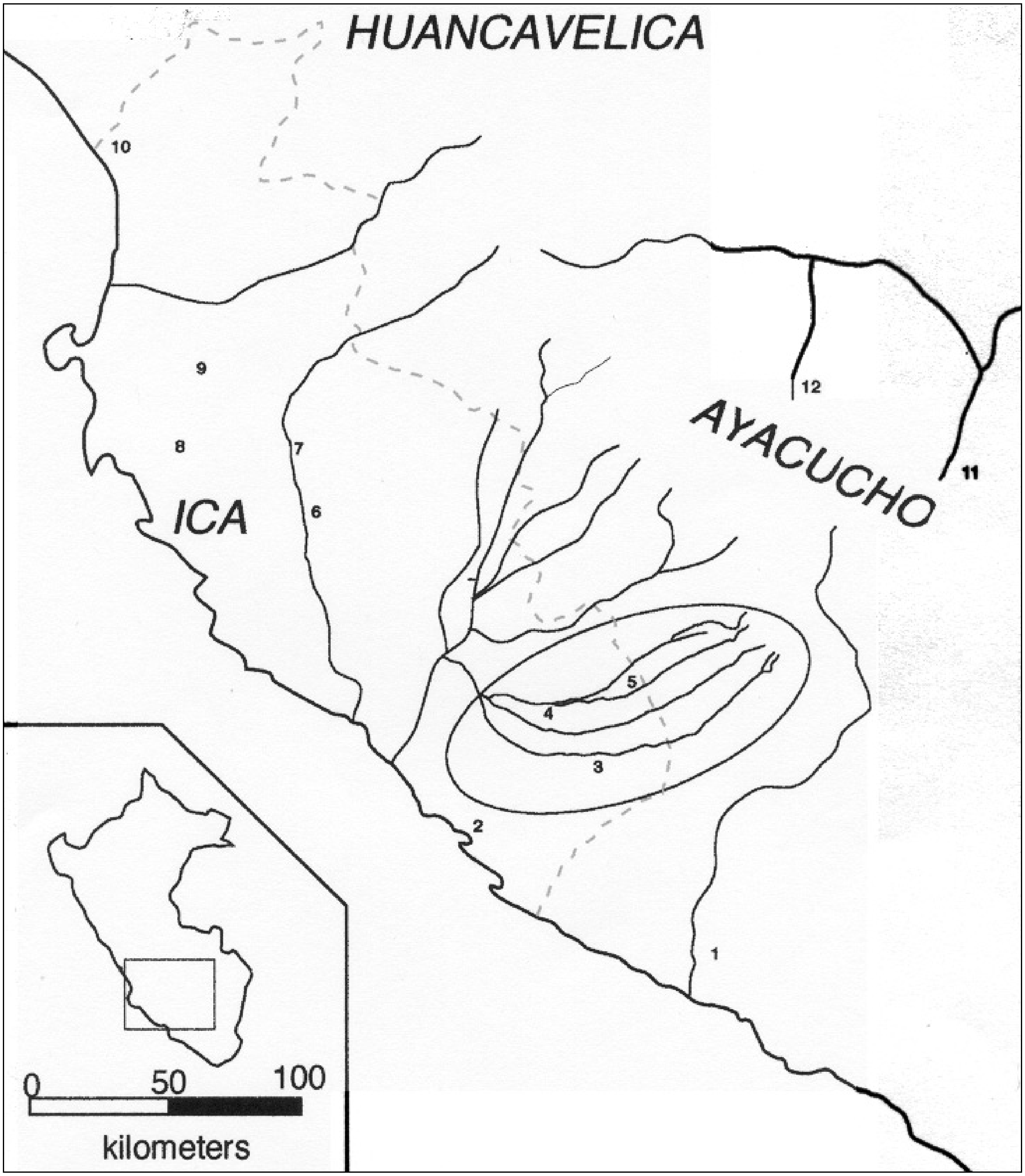

Figure 1. Map of the south coast of Peru with obsidian sources and sites mentioned in text. The oval encompasses the Southern Nasca Region, the hatched line is the modern department of Ica. 1=Hacha, 2=San Nicolás, 3=Poroma, 4=Cahuachi and La Esmeralda, 5=Marcaya, 6=Media Luna, 7=Ocucaje A, Ocucaje B, and Erizo, 8=Tajahuana, 9=San José de Cordero, 10=Chincha D, 11=Jampatilla obsidian source, 12=Quispisisa obsidian source. Map after Burger and Asaro (1979), Burger and Glascock (2000), and Burger et al. (1998a).

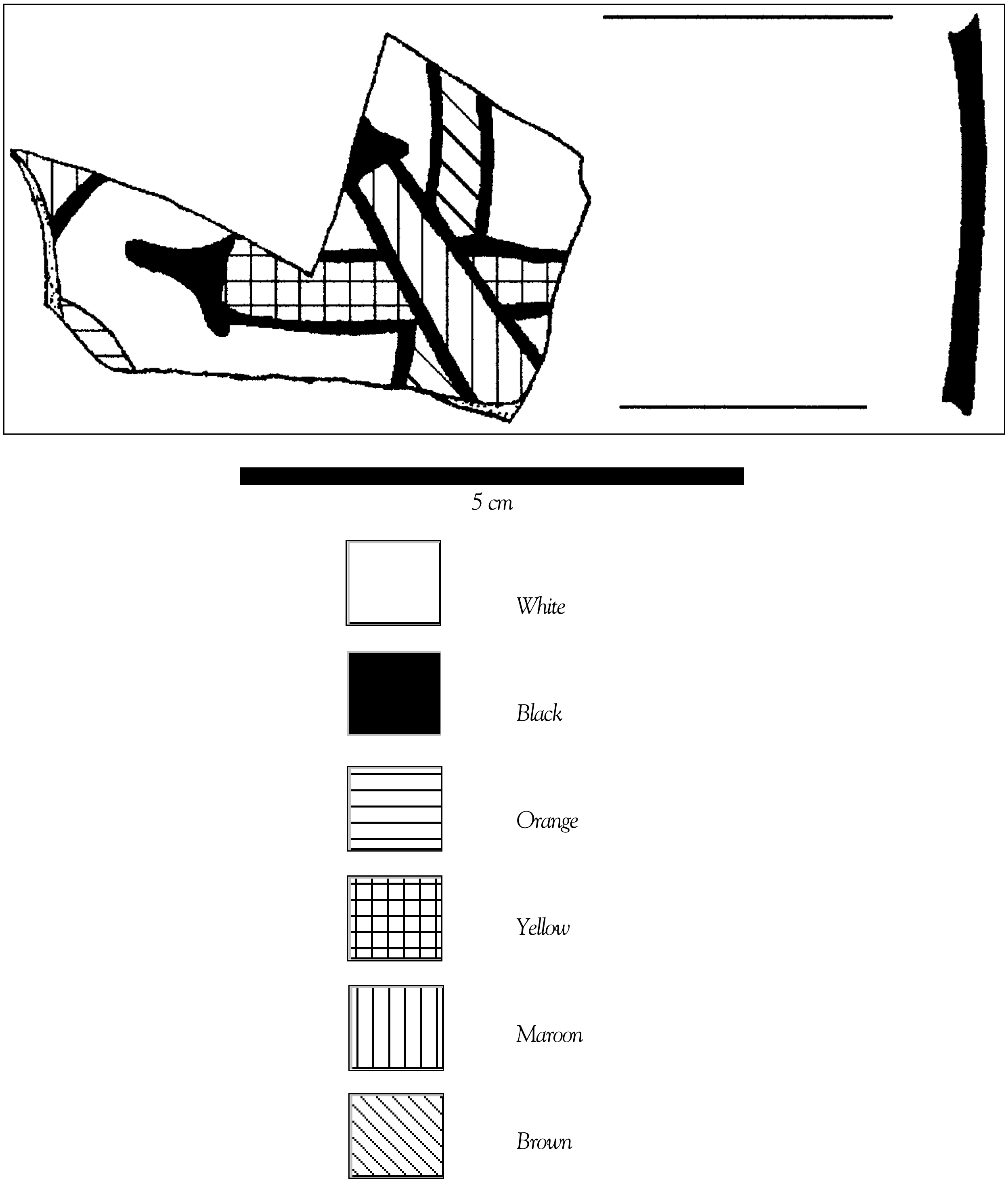

Figure 2. Fragment of bulbous vase from Marcaya depicting what appear to be obsidian projectile points. Fragment found in Structure 35 and drawn to scale.

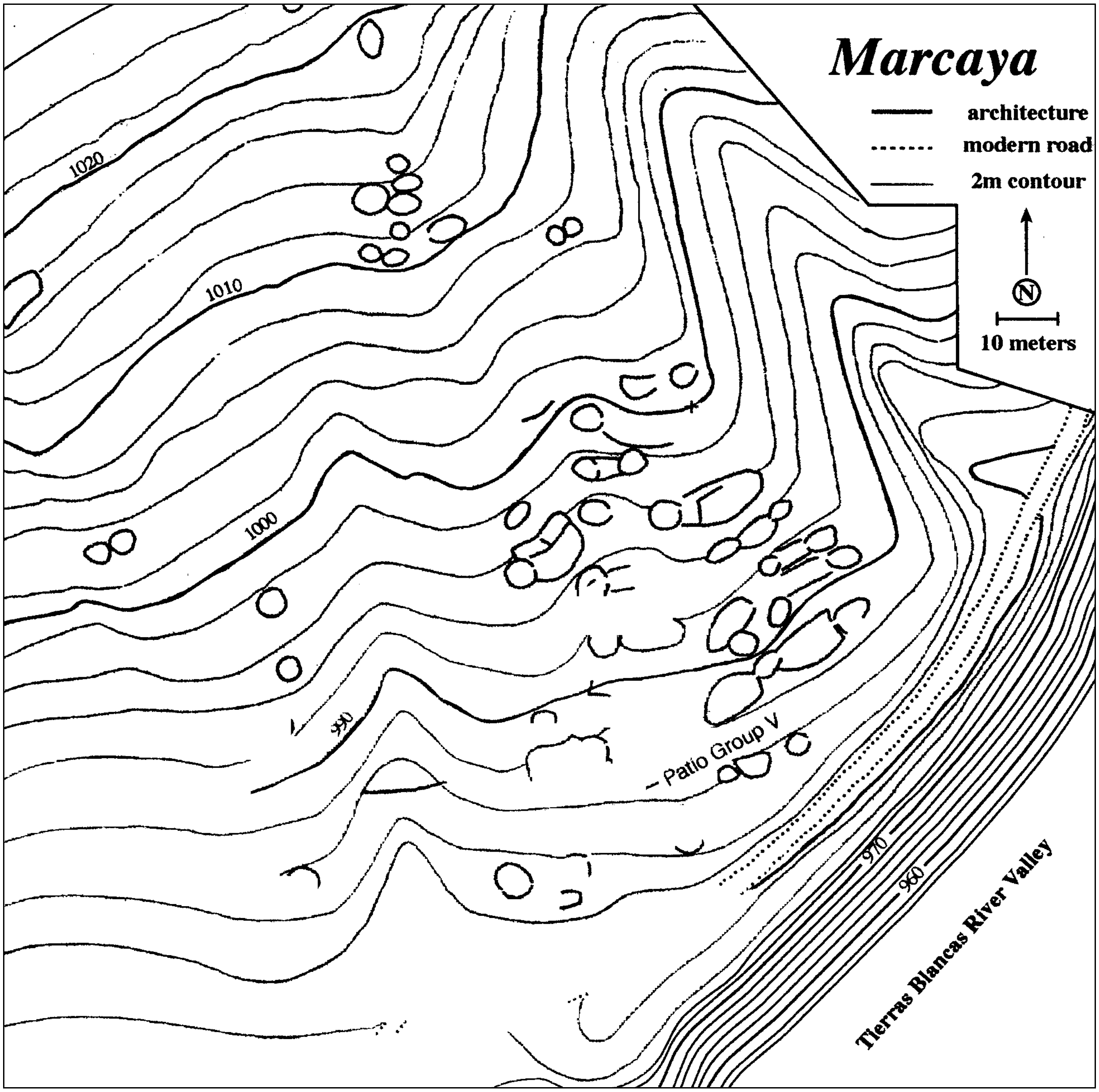

Figure 3. Topographic map of Marcaya with Patio Group V indicated.

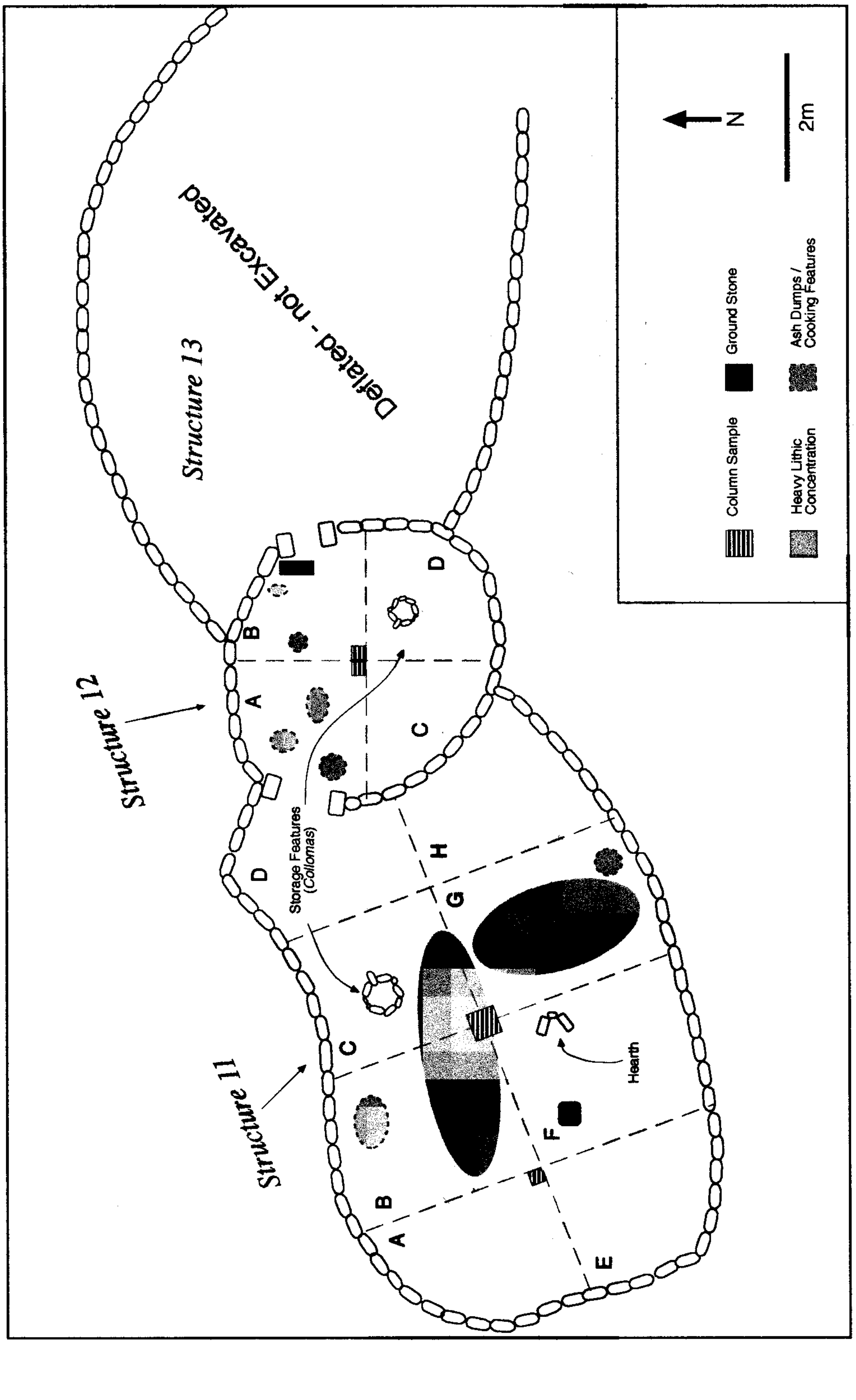

Figure 4. Excavations within Structures 11 and 12 showing the primary concentrations of artifacts relating to lithic production in Patio Group V.

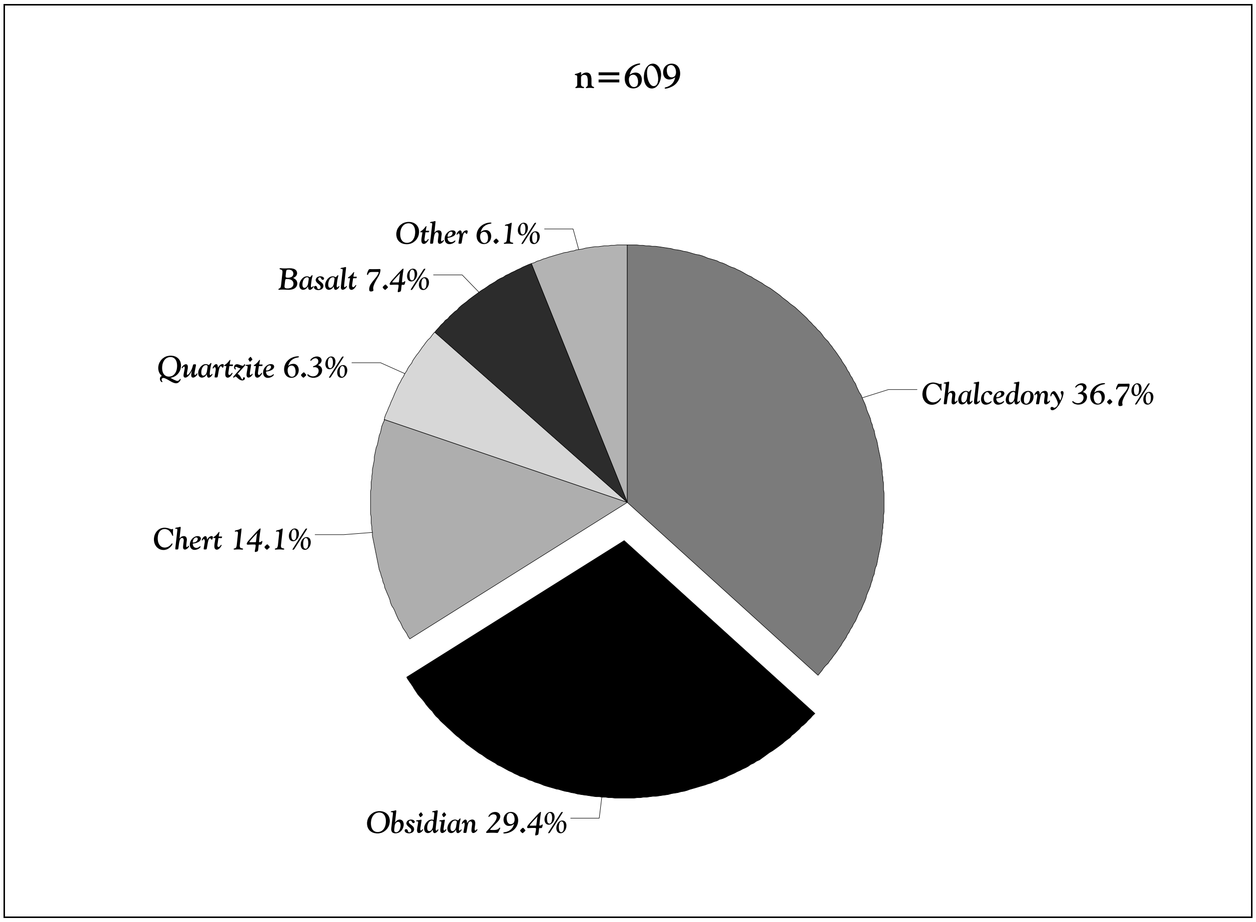

Figure 5. The lithic assemblage at Marcaya.

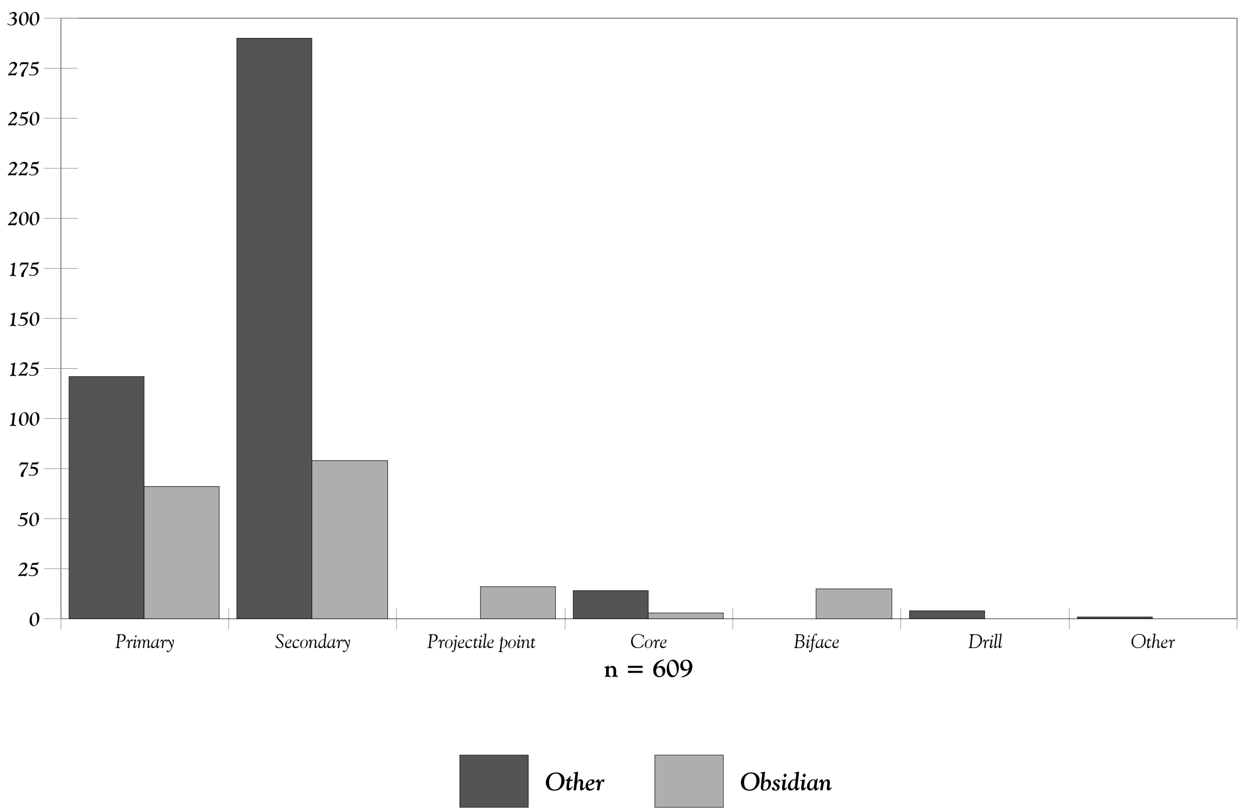

Figure 6. The lithic assemblage at Marcaya by technological category.

	Other	Obsid-
Primary	121	66
Secondary	290	79
Projectile	0	16
Core	14	3
Biface	0	15
Drill	4	0
Other	1	0

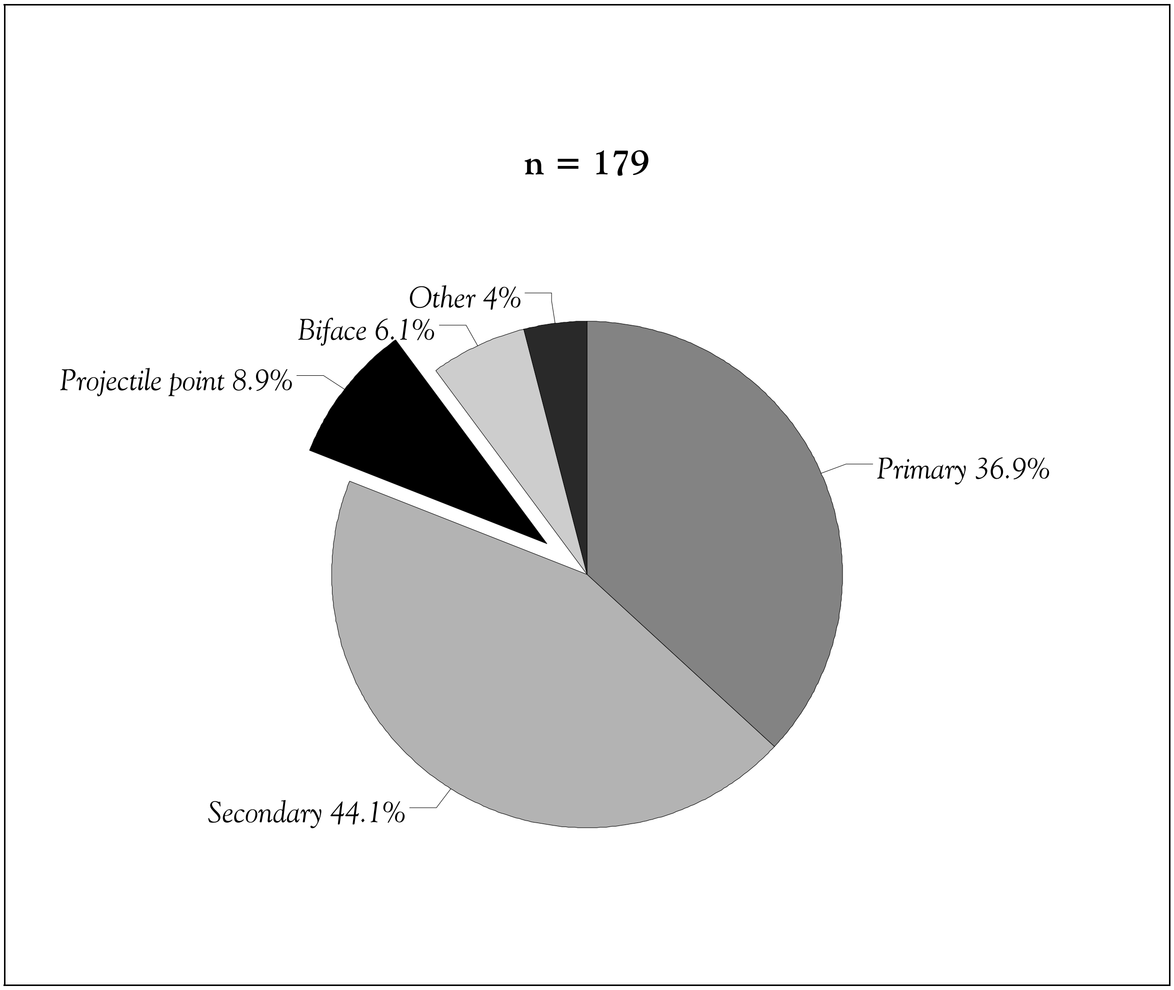

Figure 7. The obsidian assemblage at Marcaya.

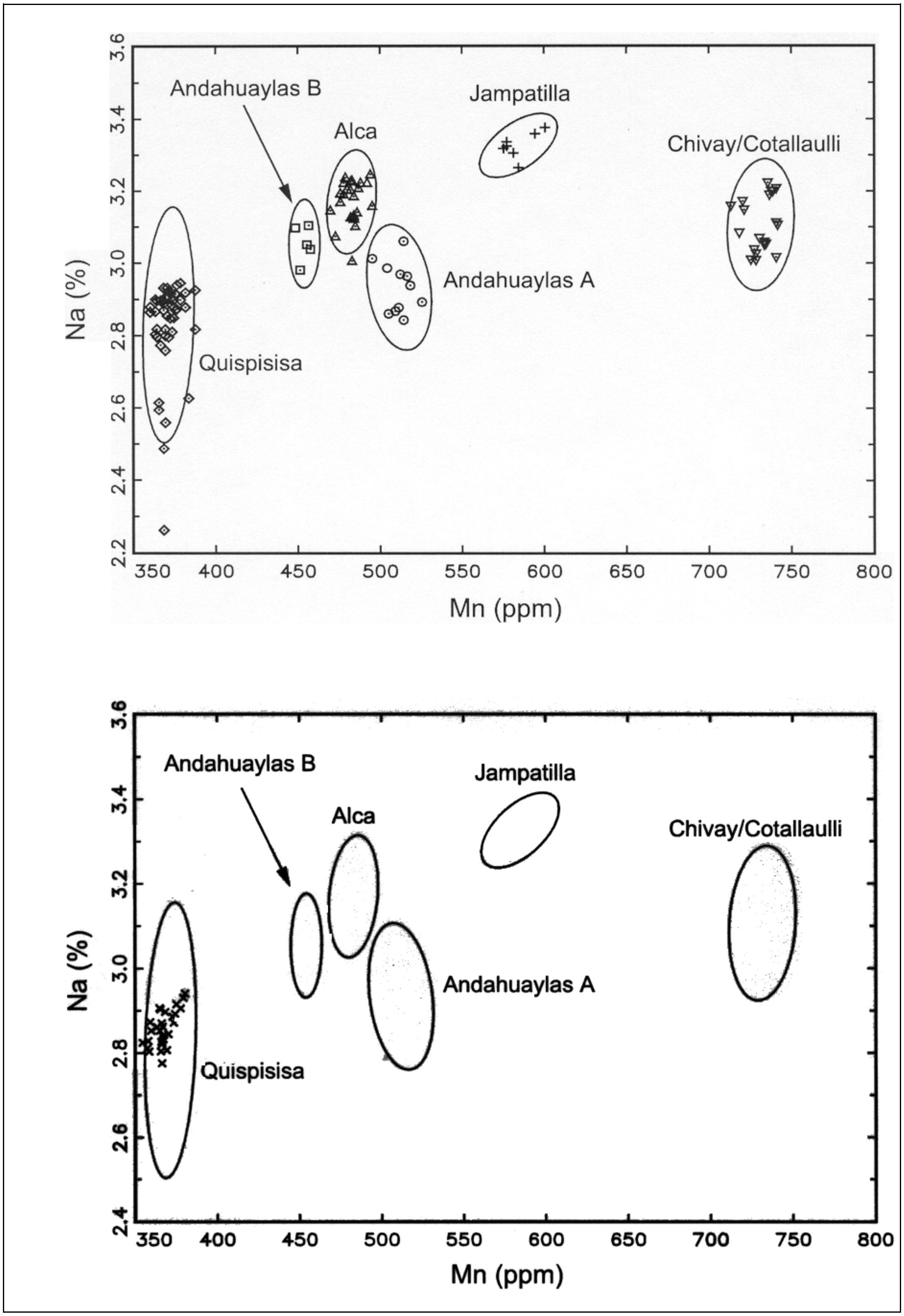

Figure 8. Two figures showing that all artifacts from the Marcaya sample are the Quispisisa type obsidian. The upper diagram shows the six primary obsidian groups in southern Peru with 95% confidence ellipses surrounding the source groups. The lower diagram shows the Marcaya artifacts projected against the six source groups.